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# Forest Pest Conditions Report for the Northeastern Area - 1986



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# 1986 FOREST PEST CONDITIONS REPORT

## FOR

### THE NORTHEASTERN AREA

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# Total Number of Acres Defoliated 1984-1986

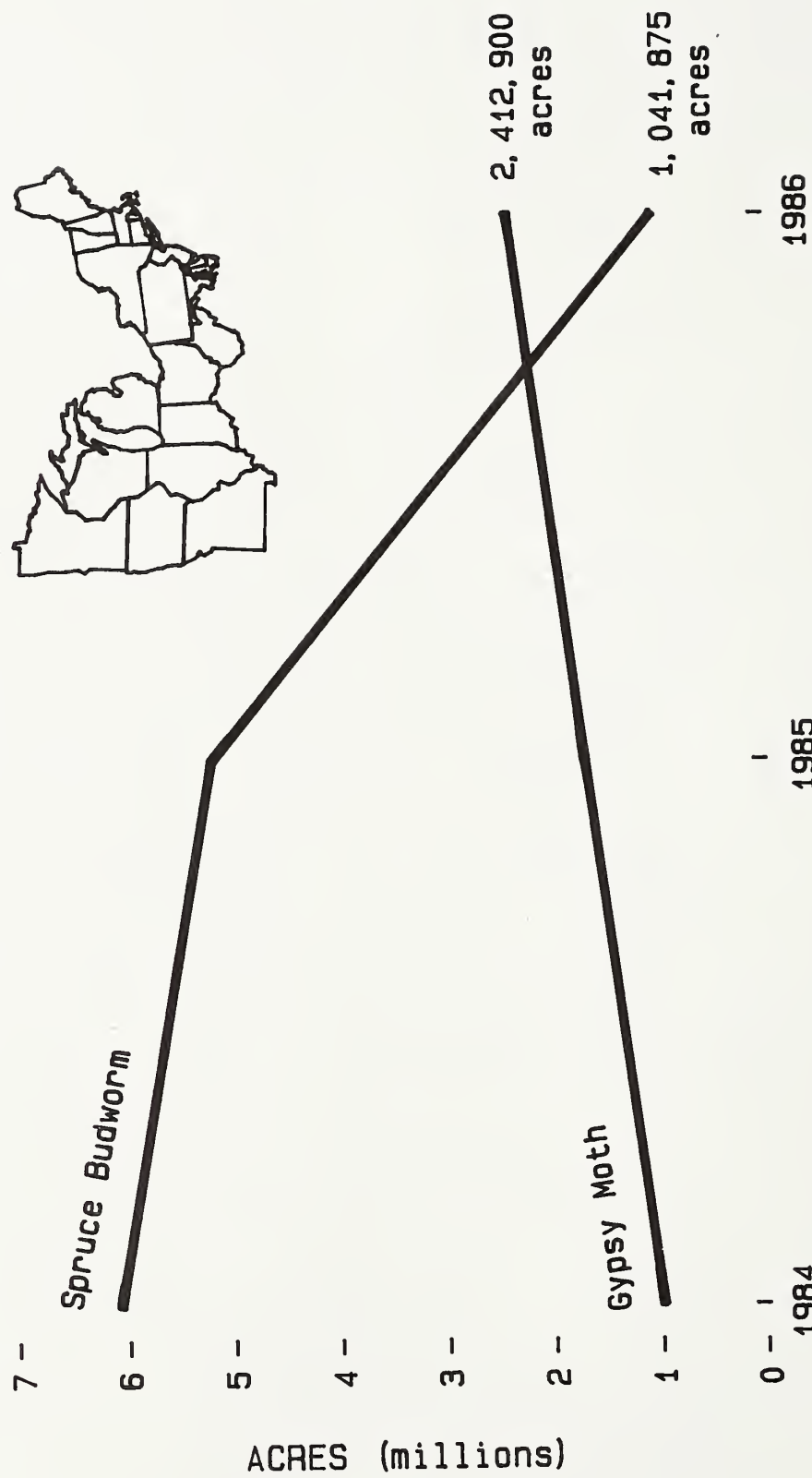


Figure 1.

## 1986 INSECT AND DISEASE CONDITIONS IN BRIEF

Most significant changes in pest conditions in 1986 were the decline of the spruce budworm infestation and the expansion or spread of the gypsy moth. Spruce budworm populations defoliated a little more than 1 million acres in 1986--compared to 5 million acres in 1985. In contrast, the gypsy moth caused defoliation increased from 1.7 million acres to more than 2.4 million acres in 1986 (See Figure 1).

Natural spread of the gypsy moth continued west through New York and Pennsylvania, and south through Maryland, Virginia, and West Virginia. Trap catches were at a record high in Iowa, and male moths were trapped almost statewide in Ohio where a "Gypsy Moth Operation Plan" is being formulated.

The white pine weevil increased in Pennsylvania, Maine, Michigan, Vermont, and New Jersey and decreased in Rhode Island. This insect was described as the "most insidious jack pine pest" in lower Michigan. The hickory bark beetle was "the worst pest in Ohio in 1986," and Dutch elm disease was reported as "probably the single most important forest and shade tree problem in West Virginia." The incidence of beech bark disease continued to increase throughout the area--this disease is reported from many new areas in New York; and it is associated with heavy mortality in West Virginia and Vermont. Oak wilt is at epidemic levels in a four-county area in Minnesota.



Also significant in the Northeast in 1986 were the diebacks and declines prevalent in both conifer and hardwood stands. Declines of ash, birch, larch, maple, oak, and spruce and fir are increasing throughout the area. Ash yellows, formerly called ash decline caused moderate mortality in Iowa, Pennsylvania, and Vermont. Oak decline, induced by drought and insect defoliation, is a more serious problem in West Virginia and Ohio. Heavy mortality in maple was reported in New York.

In general, reported insect and disease conditions were either stable or declining. The jack pine budworm was down in Michigan, Minnesota, and Wisconsin. Outside of Pennsylvania, the fall cankerworm was at low and declining levels. The Bruce spanworm, in association with other loopers, was down and only troublesome in Wisconsin and Upper Michigan. Pear thrips and the oak leaf-tier were much less prevalent in most states than in previous years. There were no dramatic changes in the occurrence of diplodia tip blight; and New York was the only State to report a substantial increase in scleroderris canker.

Though not as spectacular as losses caused by the 1985 tornadoes in Pennsylvania, isolated weather-related losses were significant. Early May frosts killed buds and developing oak leaves over large areas of Wisconsin. Vermont and New York also reported losses from frost. Ice damage took its toll in parts of Vermont causing heavy top and branch breakage. And a June hailstorm in Maine caused damage over large areas to many hardwoods and pines.



## MAJOR INSECT PESTS

### NIFER PESTS

#### JACK PINE BUDWORM

Choristoneura pinus

Hosts: Jack pine and red pine

Compared to 1985, jack pine budworm populations are down throughout the Lake States. Pheromone traps detected incipient outbreaks on the Chequamegon, Ottawa, and Hiawatha National Forests, but even here, lower numbers of captured moths confirm declining populations. Aerial surveys showed some hot spots on the Huron-Manistee and Superior National Forests. Ground surveys have also detected growing populations in Michigan's Baraga Plains. Otherwise, all indications are that low and declining populations will continue into 1987.

#### Michigan

Although a pocket of jack pine budworm activity persists on the Huron-Manistee National Forest, populations have collapsed in lower Michigan. Less than 4,000 acres of detectable defoliation is expected next year. If this holds true, it will be dramatically lower than the 100,000 acres of moderate to heavy defoliation reported in 1985.

Aerial surveys in 1986 found no visible signs of budworm defoliation in Michigan's Upper Peninsula. However, pupae and egg mass surveys confirm a growing population in the Baraga Plains area where some defoliation was observed and where the next epidemic population is expected to occur.

More than 95 percent of all operable stands on State land that were significantly damaged from the budworm have now been salvaged. Stands not salvaged continue to deteriorate.

#### Minnesota

Minnesota reported 132,600 acres showing some reddening of trees extending over a six-county area. This represents an 80 percent reduction in defoliation from 1985, and is evidence of a collapsing population.

1987 is predicted to be the last year of this epidemic of major jack pine budworm defoliation in west central and northwestern Minnesota.

#### Wisconsin

No significant defoliation occurred in Wisconsin in 1986. The outbreak that started in 1978 declined to non-epidemic levels this year.

## SPRUCE BUDWORM

### Choristoneura fumiferana

Hosts: Balsam fir; white, red, and black spruce; and hemlock.

The spruce budworm defoliated a little more than a million acres in 1986. This is an 80 percent reduction from five million acres in 1985 and continues the decline that began in Maine in 1982 - and in Vermont and New Hampshire in 1984. Spruce budworm populations were so low in some States that pheromone trapping replaced traditional aerial surveys. Minnesota was the only Lake State to report an increase (33 percent) in detectable defoliation. Minnesota is also the only State predicting an increase for 1987 (Table 1).

### Maine

Spruce budworm has declined steadily in Maine since 1982. Moderate to severe defoliation in 1986 is estimated at 600,000 acres. This is down from 1.2 million in 1985. Nearly all of the defoliation mapped in 1986 occurred in the counties of Hancock and Washington. Very small patches of moderate defoliation were seen in Somerset and Aroostock counties.

### Michigan

Spruce budworm populations collapsed across the Upper Peninsula of Michigan. No defoliation was detected from the air or observed from the ground. This compares to 94,000 acres defoliated in 1985.

### Minnesota

Approximately 400,000 acres of defoliation occurred in three northeastern counties. This is an increase of 33 percent over last year. The State also predicts another increase in the northern townships and on into southwestern Cook County over the next year.

### New Hampshire

1986 was the sixth straight year of the downward trend of the spruce budworm. The only evidence of the insect's presence has been a single moth catch each of the last two years. Endemic levels have been reached and should remain low for awhile.

### New York

There were no reports of spruce budworm defoliation in 1986.

### Vermont

The spruce budworm continued at very low levels in 1986. There was no visible defoliation for the third consecutive year.

## Wisconsin

Populations continued to decline in northwestern Wisconsin. Only light defoliation was observed in Ashland and Sawyer counties.

## HARDWOOD PESTS

### BRUCE SPANWORM

#### Operophtera bruceata

Hosts: American beech, oak, sugar maple

The Bruce spanworm, along with other loopers, caused some defoliation of northern hardwoods throughout Michigan and Minnesota. The insects were most evident in Wisconsin where moderate to heavy defoliation occurred on 100,000 acres (up from 30,000 in 1985). Insignificant activity was reported from Pennsylvania and none from New Hampshire.

Except for Wisconsin, we should expect the insect to remain widespread but cause only slight problems in 1987.

#### Maine

Populations of the Bruce spanworm remain at low levels.

#### Michigan

Hardwood defoliators were abundant throughout Michigan's Upper Peninsula where complete defoliation of hardwoods was recorded from some scattered areas. In these instances, the Bruce spanworm was found to occur along with other defoliators including the fall cankerworm, linden looper, and forest tent caterpillar.

#### New Hampshire

No defoliation was detected as a result of aerial surveys... nor did an early June ground inspection turn up any activity of this insect. Populations have remained at endemic levels in southern New Hampshire for the last three years.

#### Pennsylvania

Only 30 acres of moderate defoliation occurred in Tioga County. This continued the downward trend from 1984 and 1985.

## Wisconsin

Populations declined in old infestations in Menominee County but increased in other northeastern counties, so that over 100,000 acres of maple were defoliated in Florence, Langlade, and Marathon counties. Moderate to heavy defoliation also occurred in Price, Ashland, and Rusk counties. This 100,000 acres is a marked increase from the 30,000 acres of moderate to heavy defoliation reported in 1985...and the light defoliation reported in 1984.

## FALL CANKERWORM

### Alsophila pometaria

Hosts: Maple, oak, cherry and other hardwoods.

In general, the fall cankerworm was reported at low and declining levels in most affected States. Pennsylvania reports an 85 percent increase in defoliation and expects the trend to continue into 1987. Massachusetts also experienced an increase in activity... but does not anticipate an upward trend.

### Massachusetts

More than 8,400 acres of heavy to severe defoliation were reported from Dukes and Norfolk counties. This represents an increase over 1985. However, this trend is not expected to continue.

### Michigan

Michigan reported the fall cankerworm in association with other loopers. These insects were responsible for heavy but localized defoliation in most counties in the Upper Peninsula.

### New York

There were no changes from 1985, though reported to be increasing. Feeding was light in Jefferson and Lewis counties.

### Pennsylvania

Damage associated with the fall cankerworm increased by 85 percent in Pennsylvania during 1986 (120,000 acres up from 65,000 acres in 1985). Heavy damage was reported in Cameron, McKean, and Potter counties; moderate damage occurred in Tioga County. This is the third straight year for increases and the trend is expected to continue into 1987.

### Rhode Island

This is the fourth year of minor populations after five years of heavy defoliations.



### West Virginia

The fall cankerworm, in association with other loopers, caused complete defoliation on 300 acres in Hampshire County. Defoliation by the complex has been increasing since the early 1980's.

### Wisconsin

Wisconsin reported that the fall cankerworm outbreak that began in 1985 has declined greatly in acreage this year. This decline was most likely due to severe frost that killed buds on oaks over a large area in south central Wisconsin. Some heavy defoliation of oaks, birch, soft maple, and basswood occurred adjacent to Lake Wisconsin in Sauk and Columbia counties where the trees were protected from the frost.

## GYPSY MOTH

### Lymantria dispar

Hosts: Oaks and other Hardwoods; some Conifers

Gypsy moth defoliation increased from 1.7 million acres in 1985 to more than 2.4 million acres in 1986; this represents a 71 percent increase. Natural spread of the moth continued westward through New York and Pennsylvania and south through Maryland, Virginia, and West Virginia. The gypsy moth is also spreading in Ohio, Iowa, and central Michigan.

Defoliation increased each year since 1984; it is expected to increase again in 1987 (Table 2).

### Delaware

Delaware reports a general infestation of approximately 59,000 acres in southern New Castle and Kent counties, with localized infestations in Sussex County. This is a slight decrease from the 67,000 acres reported in 1985. Losses in 1986 are estimated at approximately 8.7 million board feet or \$875,000.

Populations will probably decline in New Castle and Kent counties in 1987. The State does not expect widespread infestation into Sussex County.

Suppression consisted of one aerial application of Dimilin (16,700 acres) and one of B.t. (42,000 acres). Results were very good with defoliation in treated areas averaging less than three percent.

### Iowa

Gypsy moth trap catches in 1986 were at a record high with 15 male moths recovered from six different counties. This compares to six male moths captured in 1985.

### Maine

Compared to 6,698 acres defoliated in 1985, nearly 12,000 acres of moderate to severe defoliation occurred in Maine during 1986. This included nearly 100 percent defoliation in central Penobscot and northern Hancock and Washington counties. Although most defoliation was in or near those stands defoliated in 1985, new areas are apparent in northern Hancock and Washington counties.

### Maryland

More than 58,000 acres of defoliation were recorded in Maryland in 1986. This is a considerable decrease from 83,488 acres reported in 1985.

### Massachusetts

Massachusetts reports a 71,000 acre decrease in defoliation from 1985 (414,000 acres down to 343,000 acres). Defoliation was recorded from southern Worcester, Middlesex, and Essex counties, and all southeastern Massachusetts. Predictions for 1987 suggest building populations in Essex County and declining populations in all other areas.

B.t. was applied by air on 980 acres in Northbridge, and 3,013 acres in Blackstone...both towns in Worcester County. Results were not available.

### Michigan

Michigan's Lower Peninsula is now generally infested and experiencing widespread defoliation in the south and southeast portions. More than 64,000 acres were defoliated in Clare, Isabella, Midland, Gratiot, Montcalm, and Saginaw counties.

### Minnesota

Ten moths were recovered during 1986. This is down from 126 moths in 1985, and 509 in 1984.

Two sites, totaling 280 acres, were treated in the Apple Valley area for the second consecutive year. Both sites were treated by helicopter with B.t. No moths were subsequently recovered from the control zones in 1986. There are no known infestations in Minnesota.

Statewide cooperation between the Department of Agriculture and the Department of Natural Resources resulted in placement of 8,780 traps in 62 counties.

### New Hampshire

Aerial surveys involving more than 3.3 million acres resulted in no noticeable defoliation. Sixty-nine pheromone trap sites detected only low populations throughout the same areas flown.

There are no reasons to expect changes in 1987.

### New Jersey

Gypsy moth defoliation slightly increased from 1985 (280,000 acres, up from 239,000). Although dollar losses are not available, the greatest losses are recorded in Passaic, Sussex, Morris, Cape May, Monmouth, Atlantic, and Cumberland counties...not necessarily in the given order.

Predictions call for continued but gradual increases.

Forty-three municipalities and four cooperating agencies participated in a cooperative control effort. A total of 63,797 acres of residential and recreational forested areas were treated with B.t. Overall, the treatments were considered less than acceptable. Larval numbers were reduced by 40 percent, and defoliation levels were reduced by 32 percent.

### New York

Populations are building in New York. Moderate to severe defoliation was reported on more than 175,000 acres in 1986 as compared to a little less than 130,000 last year. Allegheny, Cattaraugus, Steuben, Sullivan, and Ulster counties are reported as having the most defoliation in the moderate to severe category.

### Ohio

Male moths were trapped almost statewide. Egg masses were found in some northern counties. Although defoliation is still a few years away, a "Gypsy Moth Operation Plan" is being formulated by the State's Department of Agriculture and Department of Natural Resources. Suppression efforts in 1986 covered 6,000 acres using one application of Dimilin.

### Pennsylvania

Moderate to heavy defoliation involving more than 987,000 acres occurred over a 26-county area of central and northwestern Pennsylvania in 1986. This represents a 70 percent increase over the 581,000 acres reported in 1985.



Suppression activities in 1986 consisted of aerial application of B.t. on nearly 61,000 acres, Dimilin on 148,000 acres, and Alsystin on close to 3,000 acres. These treatments cost the State an average of \$12.47 per acre. The overall program provided acceptable results in most treatment areas.

State officials are predicting another increase in defoliation in 1987.

#### Rhode Island

In 1986, 230,000 acres showed moderate to heavy defoliation. This compares to approximately 134,000 acres in 1985.

Despite widespread high egg mass densities, the masses were small and the State believes they may not successfully hatch this year. Therefore, the State is predicting a decrease in defoliation in 1987.

#### Vermont

No change from 1985. Gypsy moth populations remain very low.

#### West Virginia

More than 8,000 acres were defoliated in 1986. This is a substantial increase over the 2,470 acres recorded in 1985.

A suppression project in 1986 encompassed 83,410 acres treated with Dimilin. Excellent protection and egg mass reduction were reported.

A study was conducted in 1986 to measure tree mortality that took place following the 1985 defoliation. It was estimated that timber losses in the study area due to one year's defoliation were \$73.63 per acre. The 1985 cost for aerial application of Dimilin was \$4.13 per acre. This represents a saving of \$69.50 per acre.

#### Wisconsin

Thirty-three male moths were trapped in 1986. This is an increase from the 13 male moths captured in 1985.

For the second consecutive year, no moths were taken from old infestations near Oconomowoc, Hubertus, and Monona. This substantially increases the possibility that the gypsy moth was eradicated from these areas.

## MAJOR DISEASES

### BEECH BARK DISEASE

Nectria coccinea var. faginata and Cryptococcus fagisuga

Hosts: American beech

The incidence of beech bark disease continues to increase throughout the area. Losses were reported from New York, Pennsylvania, Vermont, and West Virginia. Aerial survey found 371 acres of damage in Vermont. In New York, severe mortality was mapped during flights over Lewis County. Scale was found in five northeastern Ohio counties.

#### New York

Although not rapid, the advance of beech bark disease is reported in many areas in Tioga, Tompkins, Oswego, Onondaga, Madison, and other New York counties. Heaviest mortality was reported from Allegheny County. Mortality figures were not available.

#### Pennsylvania

No acreage was given. However, Pennsylvania reports the mortality to be increasing.

#### Vermont

Nectria-scale infections and populations measured at indicator plots, increased in Ludlow and Sherburne counties. They decreased in Woodford County. Chlorosis and dieback were visible from the air...371 acres of damage was observed in Orleans and Caledonia counties.

### DIPLODIA TIP BLIGHT

Sphaeropsis sapinea

Hosts: Austrian, jack, red, and Scotch pines

There has been no dramatic change. Rhode Island reports the second year of low to moderate infection levels or injury. Wisconsin found a higher incidence of tip blight in survey plots than in 1985.

#### Minnesota

Small, localized private stands situated around homes showed a high incidence of Sphaeropsis in Beltrami and Hubbard counties. Eighty percent of the trees died in one woodlot in Beltrami County. In Hubbard County, more than 20 sawlog-size trees have been lost in three years.

### Rhode Island

This is the second year of low to moderate infections following three to four years of significant losses. Diplodia tip blight is now considered a minor problem within the State. No estimates of volume or dollar losses are available.

### Wisconsin

In 1984, diplodia was reported as scattered throughout red and jack pine plantations and natural stands in Douglas County, northwestern Wisconsin. In 1985, survey plots were established in two plantations; they revealed an 8 percent infection rate with one percent mortality. This year (1986), it was found that a total of 26.5 percent of the trees are now infected and 2.1 percent of the infected trees have died.

## OAK WILT

### Ceratocystis fagacearum

Hosts: Oaks

Except for the Lake States, losses to oak wilt are stable or declining. In Minnesota, the disease is at epidemic proportions within an extensive four county area; and the State intends to ask its legislature for money to support an oak wilt management program this year. While in Michigan, control efforts are directed in the Shakey Lakes Resort Area at protecting timber and wildlife values on a unique 10,000 acre oak forest.

### Iowa

Oak wilt has existed in Iowa since the 1930's, and although found statewide, losses are stable. The greatest impact is on urban trees. Harvest cuts of infected forest trees is providing control.

### Michigan

Approximately 102 epicenters, ranging in size from 1/20 to 10 acres, have been detected in the Shakey Lakes area of Menominee County. An estimated loss of 3,200 trees has occurred and threatens other timber and wildlife values in a unique 10,000 acre oak forest. All but seven of the detected epicenters have had root graft barriers established by using a vibratory plow.

### Minnesota

Losses to oak wilt are at epidemic levels in an extensive four county area north of Minneapolis and St. Paul. In addition, there are scattered epicenters throughout the central and southeastern parts of the State. A half million dollar proposal is planned to go before the 1987 legislature for a statewide oak wilt management program.

## Pennsylvania

Distribution of the disease is throughout the southwestern one-third of Pennsylvania. The trend is reported to be decreasing from 1985 and the future outlook is for losses to remain stable.

## Vermont

As in 1985, oak wilt was not detected during this year's aerial surveys.

## Wisconsin

No new infested counties were observed in 1986. However, new infections were found in Marinette and Shawano counties. Aerial surveys found seven pockets in Marinette County. Six of these infection centers are along the Menominee River east of Wausaukee; the other is approximately seven miles southwest of Wausaukee. In Shawano County, the disease is spreading east and north of Shawano Lake, and west and north of Round and Grass Lakes.

## West Virginia

Aerial survey found 471 suspect trees in the eastern panhandle and 343 trees in the southern panhandle. Disease incidence appears to be stable.

## SCLERODERRIS CANKER

### Gremmeniella abietina

Hosts: Jack, red and Scotch pines

New York is the only State to report a substantial increase in the incidence of scleroderris. Even so, the State Officials say that infestations are generally light.

## Maine

There has been no change in the situation for the past three years. There were no reported losses in 1986; and no Christmas tree plantations have been found affected. Expectations are that the disease will become an incidental problem in the future.

## Michigan

The only problem reported by Michigan was loss of some 1-3 feet jack pine in Luce and Schoolcraft counties. These losses were associated with frost pockets.

## New York

New York reports infestations generally light but with substantial increase in incidence over the past three years.



## Vermont

Scleroderris was not observed in the southern portions of the State. In the Northern Region, scleroderris was newly found in two towns bordering the quarantine zone. But, the disease was not found in any new locations within the quarantine zone. The total number of infected plantations within the State is now 124 totaling 992 acres. Another six plantations were infected at one time but have since had the disease eradicated or the trees cut.

## Wisconsin

During 1986, and for the past three years, scleroderris canker has remained static - with low mortality and severe infections only on poor sites. The disease was reported from one new county in 1986, Douglas County. Here, an eight-year-old, 40 acre plantation has a light and scattered infection. Wisconsin does not expect significant mortality from this disease.

## DIEBACKS AND MORTALITY CAUSED BY COMBINED FACTORS

### ASH

#### Iowa, Minnesota, Ohio, Pennsylvania, and Vermont

Ash yellows, similar to that found in the eastern States, has been observed in Iowa for the past seven years. The disease continues to cause moderate levels of mortality in some areas. So far, it has been isolated from Fremont, Lucas, Jones, Jackson, and Dubuque counties. White ash is the most commonly affected species in the eastern part of the State, and green ash is affected mostly in the southwest.

In Minnesota, the State Shade Tree Advisory Committee reported that decline is killing rural and urban green ash trees and that it is causing significant losses to the shade tree nursery business.

In Pennsylvania, there are 1,000 acres in Sullivan County with heavy infection. The State expects tree mortality to increase as a result of the disease.

During 1986 in Vermont, ash decline increased in Franklin, Chittenden, and Addison counties. However, based on the number of requests for information coming from Bennington and Windham counties, the disease is considered to be more common in the southern part of the State. Mortality is more evident in young, pole-sized sawtimber.

## BIRCH

### Vermont and Wisconsin

Decline of yellow birch was common at upper elevations in Orleans and Essex counties, Vermont during 1986. The affected trees were reported as having unusual branch development in their lower crowns.

In Wisconsin, top dying of yellow birch was first observed in 1984. The dieback has since continued at different rates in different parts of the State. In Rusk County, trees continued to show symptoms and many trees died. In Sawyer County, dieback appeared not to have progressed from 1985. Light mortality was observed in Florence and Menominee counties.

## LARCH

### Maine and Vermont

Areas of unexplained mortality continue to be found scattered throughout Maine. During 1986, samples from 29 coastal larch stands found that overall larch mortality averaged nearly nine percent of the larch basal area.

In Vermont, larch decline continues in areas of previously recorded heavy mortality. During 1986, 108 acres containing dead and declining trees were mapped in Essex, Orleans, and Caledonia counties.

## MAPLE

### Michigan, New York, and Vermont

Heavy mortality was reported on more than 300 acres of red maple in Wayne County, New York. The disease remains common in sugarbushes and forest stands in Vermont. The State reports the disease to be more severe on wounded trees, especially those planted on shallow, wet sites at higher elevations. The disease is also a continuing problem in urban areas of Michigan's Upper Peninsula.

## OAK

### Ohio and West Virginia

Oak decline induced by drought and insect defoliation is reported as becoming a much more serious problem in West Virginia. Portions of the State have experienced drought conditions four consecutive summers. Also, the two-lined chestnut borer and armillaria sp. have been associated with the dead and dying trees.

Small pockets of oak decline and mortality are scattered across the State of Ohio. Although the disease is increasing, it is not considered significant except in residential areas and old pastured woodlots.

#### SPRUCE AND FIR

##### Massachusetts, New York, and Vermont

New York has more than 46,000 acres severely to moderately affected in Herkimer, Jefferson, and Lewis counties. In Vermont, decline remains common at higher elevations. The ghost moth, Hepialis gracilis was found feeding on roots of declining spruce and fir on Camel's Hump and other decline sites in the State. Massachusetts reports spruce decline present on more than 2,000 acres in Berkshire and Dukes counties. Mortality has been occurring for at least ten years.



# OTHER INSECT AND DISEASE PESTS

INSECT	HOST	LOCATION AND REMARKS
Balsam twig aphid <u>Mindarus abietinus</u>	Balsam fir	ME - Cyclic pest currently increasing. Has caused significant damage in many plantations over the State. Area affected in 1986 - more than 500 acres.  VT - Christmas tree damage decreased slightly compared to 1985.
Basswood thrips <u>Sericothrips tiliae</u>	Basswood	MN - Light defoliation continued throughout much of the Basswood Range in southern Minnesota.  WI - Outbreak reappeared in 1986. Light to severe defoliation on about 200,000 acres.
Birch Casebearer <u>Coleophora serratella</u>	Birch	ME - Areas of defoliation dissipating to less than 1,500 acres.
Birch leafminer <u>Fenusa pusilla</u>	Birch	MI - Local heavy populations in Upper Peninsula.  NY - Generally heavier than 1985. Widespread damage to woodland trees.  VT - Heavier defoliation than 1985. Aerial detection found 1,050 acres of defoliation in Orleans, Caledonia, and Essex counties.
Cooley spruce gall aphid <u>Adelges cooleyi</u>	Spruce	VT - Damage heavy in 1986 on Douglas Fir Christmas trees.
Eastern tent caterpillar <u>Malacosoma americanum</u>	Cherry and other hardwoods	IL - Moderate to heavy infestations throughout central and southern areas of Illinois.  NJ - Lowest level in years. Expected to remain at low levels.  NY - Marked increase over last year. Light defoliation.  RI - Population down in all parts of State for third consecutive year.

INSECT	HOST	LOCATION AND REMARKS
Fall Webworm <u>Hyphantria cunea</u>	Hardwoods	<p>IL - Moderate infestations throughout the State.</p> <p>MA - Populations are stable.</p> <p>ME - Nuisance insect in southern half of State. Incidence increased over 1985. Expected to rise again in 1987.</p> <p>NJ - Down from 1985 and decreasing.</p> <p>NY - Increasing but no mortality. Second consecutive year of defoliation in Fulton County.</p> <p>OH - Populations now in remission. Expected to decrease in future.</p> <p>RI - Populations low in all counties. This follows moderate to high levels the previous two years.</p> <p>VT - Light populations, but greater than 1985.</p>
Forest Tent Caterpillar <u>Malacosoma disstria</u>	Hardwoods	<p>IL - Heavy infestation on 2,200 acre tract in southwest Illinois on the Shawnee NF.</p> <p>ME - Populations are static and at endemic levels.</p> <p>MI - Populations building throughout much of the Upper Peninsula during 1985 and 1986.</p> <p>MN - Four fold increase in acreage (15,000 to 61,000 acres) of heavy defoliation in St. Louis and northern Carlton counties.</p> <p>NY - In general, stable conditions. Light to moderate defoliation in Allegheny County.</p> <p>VT - Populations remaining low. A cluster of pheromone traps in the Rochester Mountain area caught the same number of moths this year as in 1985.</p>

INSECT	HOST	LOCATION AND REMARKS
Hickory bark beetle <u>Scolytus quadrispinosus</u>	Hickory	OH- Several thousand acres of pastured woodlot in a nine-county area of central Ohio are experiencing up to 80 percent mortality. Has been building for the past 4-5 years. Probably the worst pest in Ohio in 1986. Will continue to get worse with decline of hickories.
Large Aspen Tortrix <u>Choristoneura conflictana</u>	Aspen	MN - Heavy defoliation (50 percent of leaves gone) occurring on over 225,000 acres in Cook County and North Shore. This is an increase of 1.5 times 1985 levels.  MI - Abundant in 1986. Defoliated many acres throughout the Upper Peninsula.
Locust leafminer <u>Odontota dorsalis</u>	Black locust	VT - Heavy defoliation reported from Putney and Hartford.  WV - Subsided in southern part of State, but extremely heavy in central and eastern West Virginia.
Maple leafcutter <u>Paraclemensia acerifoliella</u>	Sugar Maple	NY - Mostly decreasing. Some areas of defoliation.  VT - Caused light defoliation again in 1986. Visible damage from the air of 270 acres.
Nantucket pine tip moth <u>Rhyacionia frustrana</u>	Pine	IL - Only light infestations occurred on Scotch and shortleaf pine plantations in southern Illinois.
Northern pine weevil <u>Pissodes approximatus</u>	Pine	IL - Heavy infestations in 10 acre pine Christmas tree plantation in Pope County.

INSECT	HOST	LOCATION AND REMARKS
Oak leaftier <u>Croesia semipurpurana</u>	Oaks	<p>MA - Approximately 122,000 acres down from 350,000 acres reported in 1985. Populations are expected to build in Franklin County, and decline in south-eastern Massachusetts.</p> <p>ME Populations up slightly from 1985 levels with limited spots of noticeable defoliation. Increasing populations are expected again in 1987. Over past five years, have observed higher than expected mortality in previously defoliated stands.</p> <p>NJ - As in past years, remaining at very low levels.</p> <p>NY - Increasing. Second year of building populations in Fulton County. Causing some tip dieback.</p>
Oak skeletonizer <u>Bucculatrix ainsliella</u>	Oak	<p>MA - Estimated three million acres affected statewide. No losses associated with the pest. Expected to decline in future.</p> <p>NH - Previously infested areas continued to expand. Infestations detected in 19 additional townships since 1985. No discernible losses were observed.</p> <p>NY - Stable and declining populations with only scattered damage reported.</p> <p>NJ - Increasing. Involves 200 acres in Somerset and Morris counties.</p> <p>PA - More than 6,000 acres of affected area in Bradford, Fayette, Somerset, Tioga, and Westmoreland counties. This is an increasing trend and is predicted to continue.</p> <p>RI - Populations building in Providence County.</p> <p>VT - Light defoliation reported from Bennington, Windham, and Chittenden counties.</p>



INSECT	HOST	LOCATION AND REMARKS
Orangehumped mapleworm <u>Symmerista leucitys</u>	Maple	MI - Still at epidemic levels for the fourth consecutive year. Moderate defoliation observed on 2,420 acres in McNearney and Chippewa counties.  VT - No change from 1985; occasional larvae noted.
Orangestriped oakworm <u>Anisota senatoria</u>	Oak	CT - Nearly 12,000 acres of moderate to severe defoliation. This is an increase of almost 200 percent, and is the third consecutive year of significant defoliation.  NJ - Lowest levels in many years. Light defoliation in Atlantic, Cumberland, and Cape May counties.
Oystershell scale <u>Lepidosaphes ulmi</u>	Beech Hardwoods	ME - Increasing in size and intensity (500 acres in 1985 to 5,000 acres in 1986). Newly discovered heavy infestations across southern half of State found well removed from previous infestations. Future trend is not determined.  NY - Increasing. Generally light but noticeable over past years.  VT - Noticeable increase during past two years. Heavy populations causing damage and mortality in Lamoille, Chittenden, Bolton, and Georgia counties.
Pear thrips <u>Taeniothrips inconsequens</u>	Maple Cherry	NY - Decreasing in distribution and severity. Far below 1985 levels.  PA - Approximately 50 percent decrease from 1985 (51,000 acres down from 110,000 acres reported in 1985).  VT - Widespread foliage damage but dramatically less damage to sugar maple than 1985.
Periodical cicada <u>Magicalicada septendecim</u>	Hardwoods	IL - In 1986, oviposition injury on oak species caused some damage. Extent of damage is not available.

INSECT	HOST	LOCATION AND REMARKS
Pine webworm <u>Tetralopha robustella</u>	Pine	IL - Light infestation involving 120 acres on two Scotch pine Christmas tree plantations in southern Illinois.
Pine root collar weevil <u>Hylobius radicuis</u>	Pine	WI - Damage continued to increase in 1986. Red pine mortality occurred in Oconto, Burnett, Polk, Washburn, and Jackson counties.
Redhumped oakworm <u>Symmerista canicosta</u>	Oak	MI - Populations rapidly declining. Defoliation occurred in 1986, but only 1/5 of 1985 acreage.
Red pine adelgid <u>Pineus boernerii</u>	Red pine	MA - Reported from the city of Northampton in Hampshire County as new in 1986. Expected to continue spreading. No mortality as yet.  NY - Found first time in LaGrange. Most northern find in State.
Red pine scale <u>Matsucoccus resinosae</u>	Red pine	CT - 1.5 million acres. Much of the red pine in western and southern parts of State has been killed. Expected to decline with conversions to other species.  NJ - Annual inspections outside quarantine zone were negative in 98 plantations involving 514 acres.  NY - Increasing. Found for first time in towns of LaGrange and Northeast.
Saddled prominent <u>Heterocampa guttivitta</u>	Beech & Maple	ME - Populations increased for third consecutive year. Expect visual defoliation in 1987.  MI - Defoliation confined to North Fox Island of Leelanau County. About 1/3 acreage of 1985. Expected to decline more next year.  VT - Populations continue at low levels.

INSECT	HOST	LOCATION AND REMARKS
Saratoga spittlebug <u>Aphrophora saratogensis</u>	Red pine	ME - Moderate to severe browning over 100 acres. The first season in several years with this amount of damage was 1986.  MI - Very scarce in 1986. Little growth loss predicted.  WI - Populations continued at low levels. Three hundred acres damaged in Douglas and Bayfield counties.
CONIFER SAWFLIES		
European pine sawfly <u>Neodiprion sertifer</u>	Pines	NJ - Increasing; generally light infestations with some heavy defoliation in ornamental pine. Becoming a more common and serious pest.
Larch sawfly <u>Pristiphora erichsonii</u>	Larch	PA - Light damage reported on only 12 acres in Tioga County. This is down from 50 acres in 1985. Continuing program to establish parasite <u>O. benefactor</u> .  VT - Light populations.
Oak sawfly <u>Pristiphora sp.</u>	Larch	WV - Reported to be associated with more than 5,200 acres of moderate to heavy defoliation in Randolph County. Mortality is heavy and is expected to increase in 1987. Upshur County may also be involved.
Red headed pine sawfly <u>Neodiprion lecontei</u>	Pines	MI - Continuing problem in Luce, Mackinac, and Chippewa counties in the Upper Peninsula. Population below control levels in Lower Peninsula. Treatments may be indicated in 1987.  RI - Low populations for the past seven years.  VT - Light populations. Moderate damage to few pines in Wolcott County.  WI - The outbreak in Forest County collapsed. Only three colonies found on 50 acres of previously infested red pine plantations.



INSECT	HOST	LOCATION AND REMARKS
Spruce bud moth <u>Zeiraphera canadensis</u>	White Spruce	ME - Increasing problem expected in northern Maine and eastern coastal areas.
Spruce coneworms <u>Dioryctria reniculelloides</u> <u>Dioryctria abietivorella</u>	Spruce	ME - Coneworm populations are expected to remain low statewide through 1987. Last areas of moderate infestations were in Hancock and Washington counties in 1985.
Walking stick <u>Diapheromera femorata</u>	Hardwoods	OH - Populations building in 1986. Could cause defoliation in 1987.
White Pine weevil <u>Pissodes strobi</u>	Pine & Spruce	ME - Severe pest statewide. Populations and resulting damage will remain high throughout the State.  MI - Unchanged from 1985. Described as most insidious jack pine pest. "Weeviling level" measured as 36 percent.  NJ - Slightly increasing. Normally in northern New Jersey, becoming increasing problem in central portions.  PA - Statewide. Reports doubled over last year and range from one tree to as high as five acres.  RI - Populations down statewide for third consecutive year.  VT - More noticeable than in 1985. Terminal mortality noted in 14 pine plantations totalling 178 acres.
Wooly aphid <u>Adelges tsugae</u>	Hemlock	PA - Last reported in 1981, caused severe to moderate damage to 350 acres in Northampton and Lancaster counties.

DISEASE	HOST	LOCATION AND REMARKS
Annosus root rot <u>Heterobasidium annosum</u>	Red Pine	ME - No new infestations detected in 1986. Twenty three townships contain infected stands. Incidence will increase without control.
Ash leaf rust <u>Puccinia sparganioides</u>	Ash	ME - Areas which had suffered several consecutive years of heavy infestations of combined leaf rust and ash anthracnose, were down to light infestations in 1986.
Chestnut blight <u>Endothia parasitica</u>	Chestnut	MN - No new infestations.
	WI -	First observation of this disease was made in Richland County in southwestern Wisconsin. Five trees are dead and 8 to 10 are infected. A second location found in Sauk County where four trees are dead...trees have been dead at least two years.
Dutch elm disease <u>Ceratocystis ulmi</u>	Elm	Areawide.  NY - Increasing in Fulton County. Mortality observed in forest stands.  OH - Spread to all counties within State. Few elm left in residential areas.  VT - Heavier than usual again this year.  WV - Disease incidence throughout the State was high again in 1986. Reported as probably the single most important forest and shade tree problem in West Virginia.
European larch canker <u>Lachnellula wilkommii</u>	Larch	ME - No new infected townships were located in 1986. State and Federal quarantines continue to be enforced.

DISEASE	HOST	LOCATION AND REMARKS
Fir-Fern rust <u>Uredinopsis mirabilis</u>	Balsam fir	<p>ME - 1986 was more severe than 1985. Although reported to be increasing, this is mostly an aesthetic pest of Christmas trees.</p> <p>NY - Increasing in Fulton and Hamilton counties with use of concolor fir for Christmas trees.</p> <p>VT - Increased in 1986. Two hundred fifty-four acres found infected, of which 86 acres had moderate to heavy damage. This compares to 94 acres and 40 acres respectively for 1985.</p>
Needlecasts:		
<u>Cyclaneusma minus</u>	Scotch pine	WI - Present in 21 counties. Trend and losses were not reported.
<u>Lophodermium pinastri</u>	Scotch pine	<p>NY - Reported as affecting Christmas trees on 100 acres in Fulton County</p> <p>VT - No change from 1985. Mostly light damage in Christmas tree plantations.</p> <p>WV - Generally light. Moderate damage reported from one 30 acre plantation in Preston County.</p>
<u>Neamacylus minor</u>	Scotch pine	<p>ME - Not found in Maine prior to 1985. Two large and one small plantation affected in 1986. Without control could amount to \$600,000 loss.</p> <p>VT - Increasing. Known infested are 42 acres, including 20 acres of moderate damage in Troy.</p>
<u>Rhabdocline pseudotsugae</u>	Douglas Fir	<p>ME - Incidence increased over the past 30 years until virtually every plantation site is infected. Heavy infection rates resulted in abandonment of Christmas tree production.</p> <p>VT - Occasionally heavy in Christmas tree plantations in Barton and Essex counties.</p>

DISEASE	HOST	LOCATION AND REMARKS
<u>Rhizosphaera kalkhoffii</u>	Spruce	VT - Causing moderate needle loss in Christmas tree plantations in Walden County. WV - Incidence is increasing. Usually moderate to light damage reported.
Shoestring root rot <u>Armillariella mellea</u>	Conifers	NY - Increasing in Fulton and Hamilton counties. Reported affecting 400 acres. Some mortality in Otsego County. VT - Remains common on stressed trees exhibiting dieback.
Weather related damage	Mixed pines & Hardwoods	ME - A June hailstorm caused damage over a broad area around Naples and Raymond, Maine. VT - Ice damage was common in 1986. A late January storm in Lamoille County and parts of Washington and Caledonia counties was especially severe causing heavy branch and top breakage. Slopes of the Worcester range appeared whitish in color due to freshly exposed wood. Frost was also damaging in Vermont. Most noticeably affected were balsam fir, Douglas-fir, aspen, red maple, sugar maple, and white ash. WI - Early May frost killed buds and developing oak leaves over large areas in several south central counties. A late May frost damaged new shoots of white spruce and killed growth on oak, ash, larch, and big-tooth aspen in several counties. Snow damaged many two-year-old Scotch pine in the central counties.
White pine blister rust <u>Cronartium ribicola</u>	White pine	ME - Control area covers more than 1.8 million acres. Excellent control reported from within the control area. Heavy losses are common outside the control area. WV - Surveyed 26,300 acres. 9,718 <u>Ribes</u> plants destroyed.



Table 1. Acres of Spruce Budworm Defoliation in the Northeast - 1984-1986

----- ACRES DEFOLIATED -----			
STATE	1984	1985	1986
Maine	5,500,000	4,800,000	600,000
Michigan	192,400	93,800	1,600
Minnesota	361,600	307,300	440,000
New Hampshire	0	0	0
New York	0	300	275
Vermont	0	0	0
Wisconsin	22,000	15,000	0
Total	6,076,000	5,216,400	1,041,875

Table 2. Acres of gypsy moth defoliation in the Northeast - 1984-1986.

----- ACRES DEFOLIATED -----			
STATE	1984	1985	1986
Connecticut	500	89,500	237,200
Delaware	14,200	5,100	3,100
Maine	1,900	6,700	11,600
Maryland	42,000	83,500	58,200
Massachusetts	185,500	414,100	343,100
Michigan	6,400	18,500	61,400
New Hampshire	0	0	0
New Jersey	98,700	239,400	280,300
New York	33,700	129,800	175,400
Pennsylvania	450,600	581,100	987,800
Rhode Island	164,600	133,900	219,200
Vermont	0	0	0
Virginia	0	5,200	27,300
West Virginia	0	2,500	8,300
Total	998,100	1,709,300	2,412,900









